AMENDMENTS TO THE CLAIMS

The listing of claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. **(Original)** An optical modulator, divided into at least two active segments separated by at least one passive segment, the modulator comprising:

an optical waveguide with an optical group index (n_o) having an optical signal propagating at an optical velocity (v_o), and

a microwave transmission line with an electrical propagation index (n_p), having an electrical signal propagating at an electrical velocity (V_e), wherein the electrical propagation index (n_p) of the unloaded microwave transmission line is lower than the optical group index (n_o) of the optical waveguide, characterized in that the loading and length of the microwave transmission line are adjusted for a specific Bloch impedance and electrical velocity (v_e).

2. **(Original)** An optical modulator according to claim 1, characterized in that the electrical velocity (V_e) in the adjusted microwave transmission line is substantially equal to the optical velocity (v_o) in the optical waveguide.

3. **(Original)** An optical modulator according to any of claims 1 or 2, characterized in that the length of the microwave transmission line from the center of one active segment to the center of the adjacent active segment is longer than the length of the corresponding optical waveguide from the center of one active segment to the center of the adjacent active segment.

4. **(Currently Amended)** An optical modulator according to any of claims [[1 – 3]] 1 or 2, characterized in that the active segment of the optical modulator is a microwave transmission line and is cascaded in series with the microwave transmission line of the passive segment.

5. **(Currently Amended)** An optical modulator according to any of claims [[1 – 4]] 1 or 2, characterized in that the optical modulator is an electro-absorption modulator.

6. **(Original)** A method for adapting the impedance in an optical modulator which is divided into at least two active segments separated by at least one passive segment, wherein the modulator comprises:

an optical waveguide with an optical group index (n_o) having an optical signal propagating at an optical velocity (v_o), and

a microwave transmission line with an electrical propagation index (n_p), having an electrical signal propagating at an electrical velocity (V_e), wherein the electrical propagation index (n_p) of the unloaded microwave transmission line is lower than the optical group index (n_o) of the optical waveguide, characterized by

adjusting the loading and length of the microwave transmission line for a specific Bloch impedance and electrical velocity (V_e).

7. **(Original)** A method according to claim 6, characterized by adjusting the loading and length of the microwave transmission line in such a way that the electrical velocity (V_e) in the adjusted microwave transmission line becomes substantially equal to the optical velocity (v_o) in the optical waveguide.

8. **(Original)** A method according to any of claims 6 or 7, characterized by adjusting the length of the microwave transmission line in such a way that the length from the center of one active segment to the center of the adjacent active segment becomes longer than the length of the corresponding optical waveguide from the center of one active segment to the center of the adjacent active segment.

9. **(Currently Amended)** A method according to any of claims [[6 – 8]] 6 or 7, characterized by implementing the active segment of the optical modulator as a microwave transmission line and cascading it in series with the microwave transmission line of the passive segment.

10. **(Currently Amended)** A method according to any of claims [[6 – 9]] 6 or 7, characterized by the optical modulator being an electro-absorption modulator.

11. **(New)** An optical modulator having an active segment and a passive segment comprising:

a substrate;

an electrically conducting layer arranged on top of at least a portion of the substrate;

an active optical layer arranged on top of at least a portion of the electrically conducting layer;

an optical waveguide arranged on top of at least a portion of the active optical layer;

a conductive layer forming an electrical ground arranged beside the optical waveguide, the conductive layer forming a first part of an electrical transmission line;

an electrical electrode forming a second part of the electrical transmission line, wherein the electrical electrode is arranged on top of and in connection with the optical waveguide in the active segment.

12. **(New)** The optical modulator in accordance with claim 12, wherein the electrical electrode is arranged beside the optical waveguide and isolated from the conductive layer by a dielectric layer in the passive segment.

13. **(New)** The optical modulator in accordance with claim 12, wherein the substrate and/or the active optical layer are one of a III-IV semiconductor material, $LiNbO_3$ material, or a polymer material.